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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/828,663 | 04/21/2004 | Peter R. Hull | 135830 | 4932 |
| 7590 | 12/23/2005 | | EXAMINER | |
| John S. Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan Square St. Louis, MO 63102 | | | KIM, TAE JUN | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3746 | |
| DATE MAILED: 12/23/2005 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/828,663 | HULL ET AL. | |
| | Examiner | Art Unit | |
| | Ted Kim | 3746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 22 November 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) 1-7, 11-14, 19 and 20 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 8-10 and 15-18 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>04/21/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group II and claims 8-20 is acknowledged in the response of 11/22/05. In the Examiner's last treatment of applicant's election, it was noted that claims 8-20 and the method of making the engine were mutually exclusive. As applicant again elected claims 8-20 [*and the method of making the engine sic*], for the purposes of expediency, claims 1-7 drawn to a method of making the engine have been withdrawn. Furthermore, applicant elected claims 8-20 as reading on the elected species of Figs. 1-5, as claims 11-14, 19, 20 do not read on this species but on that of Fig. 6, these claims have also been withdrawn. The traversal is on the ground(s) that groups I and II are related and the relevancy of search and examination of one group to the other group. However, as the examiner has previously demonstrated these groups are patentably distinct for the reasons set forth and search of one group does not require search of the other group due to their different classifications.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claim 17 is objected to because of the following informalities: on the last paragraph, line 3, "a combustor" should be –said combustor—as the combustion has previously been recited. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 8-10, 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dyste et al (3,222,864). Dyste et al teach a gas turbine engine comprising: a compressor 30; a combustor 80 downstream from said compressor; a turbine 71 coupled in flow communication with said combustor; and a heat exchanger assembly comprising: an annular heat exchanger 14 coupled in flow communication to a compressor 30, said heat exchanger configured to channel compressor discharge air 70 to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said annular heat exchanger 14 is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine. A heat exchanger assembly for a gas turbine engine, said heat exchanger assembly comprising: an annular heat exchanger 14 coupled in flow communication to a compressor, said heat exchanger configured to channel compressor discharge air to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; an outer casing 46 coupled to said heat

exchanger and to a gas turbine rear frame 84 such that said annular heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; further comprising: an inlet manifold (near 52) coupled in flow communication with said compressor; an outlet manifold (near 70) coupled in flow communication with said combustor; and wherein said heat exchanger comprises a plurality of heat exchanger elements 60, each said heat exchanger element comprising an inlet side in flow communication with said inlet manifold and an outlet side in flow communication with said outlet manifold; wherein said inlet manifold comprises a cross-sectional area that is inversely proportional to a cross-sectional area of said outlet manifold (note that the cross sectional area of the inlet and manifolds are in the same annular region of the engine and that as one of them gets bigger by inverse proportion the other is inherently smaller); a plug nozzle 94 fixedly secured to a gas turbine rear frame to facilitate controlling an amount of compressor air channeled through said heat exchanger.

5. Claims 8-10, 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Beam, Jr et al (3,386,243). Beam, Jr et al teach a gas turbine engine comprising: a compressor 5; a combustor 7 downstream from said compressor; a turbine 9 coupled in flow communication with said combustor; and a heat exchanger assembly 10 comprising: an annular heat exchanger 10, 18 coupled in flow communication 13 to a compressor, said heat exchanger configured to channel compressor discharge air 14 to a combustor 7, said heat exchanger assembly 10, 18 coupled to said gas turbine engine such that said annular heat exchanger is substantially concentrically aligned with respect to an axis of

rotation of the gas turbine engine. A heat exchanger assembly for a gas turbine engine, said heat exchanger assembly comprising: an annular heat exchanger 10, 18 coupled in flow communication to a compressor 5, said heat exchanger configured to channel compressor discharge air to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; an outer casing 17 coupled to said heat exchanger and to a gas turbine rear frame 9, 15 such that said annular heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; further comprising: an inlet manifold (downstream of 13) coupled in flow communication with said compressor 5; an outlet manifold near entrance of 14 coupled in flow communication with said combustor; and wherein said heat exchanger comprises a plurality of heat exchanger elements, each said heat exchanger element comprising an inlet side in flow communication with said inlet manifold and an outlet side in flow communication with said outlet manifold; wherein said inlet manifold comprises a cross-sectional area that is inherently inversely proportional to a cross-sectional area of said outlet manifold (note that the cross sectional area of the inlet and manifolds are in the same annular region of the engine and that as one of them gets bigger by inverse proportion the other is inherently smaller); a plug nozzle 35 fixedly secured to a gas turbine rear frame 9, 15 to facilitate controlling an amount of compressor air channeled through said heat exchanger.

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 8-10, 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirin (3,201,938) in view of either Beam, Jr et al (3,386,243) or Dyste et al (3,222,864).
Zirin teaches a gas turbine engine comprising: a compressor 11; a combustor 12 downstream from said compressor; a turbine 13, 14 coupled in flow communication with said combustor; and a heat exchanger assembly 22 comprising: a heat exchanger 22 that appears to be annular (note that among other things manifolds 23, 24 are annular) coupled in flow communication to a compressor 11, said heat exchanger 22 configured to channel compressor discharge air 28 to a combustor, said heat exchanger assembly 22 coupled to said gas turbine engine such that said heat exchanger 22 is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine. A heat exchanger assembly 22 for a gas turbine engine, said heat exchanger assembly comprising: a heat exchanger 22 that appears to be annular coupled in flow communication to a compressor, said heat exchanger configured to channel compressor discharge air 28 to a combustor, said heat exchanger assembly coupled to said gas turbine engine such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; an outer casing 20 coupled to said heat

exchanger and to a gas turbine rear frame such that said heat exchanger is substantially concentrically aligned with respect to an axis of rotation of the gas turbine engine; further comprising: an inlet manifold 24 coupled in flow communication with said compressor; an outlet manifold 23 coupled in flow communication with said combustor; and wherein said heat exchanger comprises a plurality of heat exchanger elements, each said heat exchanger element comprising an inlet side in flow communication with said inlet manifold 24 and an outlet side in flow communication with said outlet manifold 23; wherein said inlet manifold comprises a cross-sectional area that is inversely proportional to a cross-sectional area of said outlet manifold (note that the cross sectional area of the inlet and manifolds are in the same annular region of the engine and that as one of them gets bigger by inverse proportion the other is inherently smaller); a plug nozzle (see Fig. 5) fixedly secured to a gas turbine rear frame to facilitate controlling an amount of compressor air channeled through said heat exchanger. As discussed above, it would appear that the heat exchanger is annular, but in order to obviate any doubt, Beam Jr et al and Dyste et al teach that the heat exchanger is annular. It would have been obvious to make the heat exchanger annular as a well known or conventional configuration utilized in the art.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The

Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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